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EXAMINER
WU, JINGGE

ART UNIT	PAPER NUMBER
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/470,741	Applicant(s) JIANG ET AL.	
	Examiner Jingge Wu	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-9,11-21 and 23-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-9,11-21 and 23-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *19* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicants' response to the last Office Action, filed February 12, 2003 has been entered and made of record.

Remarks

Applicant's arguments with respect to claims 1-9, 11-21, 23-34 have been fully considered, but they are not persuasive.

a. Applicant argues that no prima facie cases of obviousness has been established because the motion vectors disclosed in Ng is different from those in Vetro. Furthermore, no motivation is found in both Vetro and Ng to combine them.

However, in response to applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. In the instant case, the motion vectors in Ng are codewords which identify 8x8 block of pixels as applicant pointed out, while the motion vectors in Vetro is also vectors (or codewords) used to specify the neighborhood of blocks (page 11, section 4.3). Thus, the motion vectors in Ng and Vetro have no significant difference to prevent the combination the references. Regarding to the motivation to combining the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In the instant case, first, both Vetro and Ng in the HDTV image processing

field , especially low resolution motion compensation. Vetro clearly discloses a similar method and apparatus for low-resolution motion compensation. Although ~~Yoshioka~~ Vetro does not show that scaling a motion vector in according with a downsampling ratio, such processing techniques is taught by Ng (Fig. 5, col. 6 lines 1-7). Moreover, Ng uses the techniques to improve the image quality and reconstruction accuracy (Ng. Col. 6 lines 8-45), which is problem intended to be solved in Vetro (abstract). Finally, since the above mentioned limitations are contained in Vetro and Ng to show that knowledge which was within the level of ordinary skill at the time the claimed invention was made, and as can be seen from the rejection, it has taken in to account only knowledge which was within the level of ordinary skill, i.e. knowledge from the patens themselves. Therefore, such reconstruction is proper and prima facie case has been established.

b. Applicant further argues that "none of the prior art relied upon the Examiner suggests the selective combination of teachings of Vetro et al., Ng, and Bose et al. relied upon by the Examiner" and "No guidance is supplied by any of the prior art relied upon by the Examiner that would resolve their mutually contradictory teachings so as to suggest the selective combination of teachings proffered by the Examiner."

Examiner strongly disagrees. Bose is in the same field (HDTV image processing) as those of Vetro and Ng. Bose is cited to show that "the motion vector specifying relative distance of reference data from a macroblock" is well known in the art. The motivation to combine Bose is explicitly cited in Bose and Vetro (Bose, col. 3-col. 4, Vetro, abstract). So long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include

knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding the "guidance' requested by the Applicant to combining the references, Examiner recognizes the test for obviousness is not whether the features of the reference may be bodily incorporated into the other to produce the claimed subject matter but simply what the references make obvious to one of ordinary skill in the art. In Re Bozek, 163 USPQ 545, (CCPA 1969); In re Richman 165 USPQ 509, (CCPA 1970); In re Beckum, 169 USPQ 47(CCPA 1971); In re Sneed, 710 F.2d 1544, 218 USPQ 385. In the instant case, all claimed limitations are disclosed in the references. The guidance to combine the teachings is and has been always the objective standard, i.e., "produce the claimed subject matter but simply what the references make obvious to one of ordinary skill in the art.", rather than the Applicant's demand that "the features of the reference may be bodily incorporated into the other to produce the claimed subject." According to the guidance, the references clearly show that all claimed limitations are well known in the art, the reproduction of the claimed subject matters from the references makes obvious to one of ordinary skill in the art because the motivations of combining them are presented in the references (see above).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7, 9, 11-12, 16-19, 21-24, 28-30 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Frequency domain down-conversion of HDTV using an optimal motion compensation scheme" to Vetro et al. ("Vetro" a refernce of the record). Vetro in view of US5262854 to Ng (a reference of the record) and US 6215822 to Bose et al.

As to claim 1, Vetro discloses a method of performing video image decoding comprising:

downsampling (down-conversion) a compressed video image in the frequency domain (DCT domain) (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2);

inverse transforming (IDCT) the downsampled video image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2 and pages 11, section 4.3).

Vetro further discloses downscaling the motion vector (pages 10-12) but does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Ng in the method of Vetro in order to improve the image reconstruction accuracy (Ng, col. 6 lines 8-45, Vetro, abstract). Doing so would convert the format of the motion vector so as to improve accuracy of image reconstruction so that the quality of the method is improved.

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, explicitly teaches limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

As to claim 16, Vetro discloses a method of performing video image decoding comprising:

inverse transforming (IDCT) the a compressed video image (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2);

downsampling (down-conversion) a compressed video image in the spatial domain (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2, and page 11, section 4.3).

Vetro further discloses downscaling the motion vector (pages 10-12) but does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

Analogous argument is addressed with respect to claim 1.

As to claims 2 and 17, Vetro further discloses wherein the compressed video image in the frequency domain comprises a discrete cosine transform image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2).

As to claims 3 and 18, Vetro further discloses the DCT image is stored as complying with an MPEG specification(Abstract, note that the DCT image of Vetro is inherently stored as MPEG because the Vetro method is to solve the drift and block artifact problems of MPEG-2).

As to claim 4, Vetro further discloses the DCT image is stored as a frame type image (Fig. 8 , scheme 1, page 9, section 4.1).

As to claim 5, Vetro further discloses the motion compensation data signals are stored as frame prediction type motion compensation (page 11, section 4.3).

As to claim 6, Vetro further discloses the DCT image is stored as a field type image (Fig. 9 , scheme 1, page 10, section 4.2).

As to claim 19, all elements are addressed with regard to claims 4 and 6.

As to claims 7 and 21, Vetro further discloses the motion compensation data signals are stored as field prediction type motion compensation (page 11, section 4.3).

As to claim 9, Vetro further discloses the downsampling is performed using an integer ratio(Fig. 6, page 6, note that 16x16 DCT macroblock is down-conversion to 8x8 DCT macroblock and the ratio is 2).

As to claim 22, Vetro further discloses the step of performing motion compensation comprises scaling motion vectors in according with a downscaling ratio (Fig. 3b, page 4-5, section 2, note that the downconversion spatial filter x is inherently of a downscaling ratio).

As to claim 23, Vetro further discloses wherein motion vector compensation comprises implementing an interpolation operation (Fig. 3b, page 4, section 2, and page 11, section 4.3 note that equation (1) is an interpolation operation).

As to claim 24, Vetro further discloses motion compensation scaling implementing a bilinear interpolation operation (page 12, note that 4x4 cut with bilinear interpolation).

As to claims 11-12, the discussions are addressed with regard to claims 22-23, respectively.

As to claim 28, Vetro discloses elements such as downsampling in frequency domain, inverse transforming, and motion compensation (the discussions are addressed with regard to claims 1-3, respectively) but does not explicitly mention an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform and scaling motion vectors in according to a downsampling ratio.

Ng, in an analogous environment, discloses an article result in following : a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the controller 302, as a state machine, is inherently to have a storage medium storing the program (instructions) executed by a platform because of the programmed routines), and performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Ng in the method of Vetro in order to improve the image reconstruction accuracy (Ng, col. 6 lines 8-45, Vetro, abstract). Doing so would convert the format of the motion vector so as to improve accuracy of image reconstruction so that the quality of the method is improved.

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion

vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

As to claims 29-30, the discussions are addressed with regard to claims 2-3, respectively.

As to claim 32, Vetro discloses elements such as downsampling in spatial domain, inverse transforming, and motion compensation (the discussions are addressed with regard to claim 16) but does not explicitly mention an article result in following: a storage medium, having stored thereon instructions, that when execute by a platform and does not explicitly mention performing motion compensation comprises scaling motion vectors in according with the downsampling ratio.

Ng, in an analogous environment, discloses an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the controller 302, as a state machine, is inherently to have a storage medium storing the program (instructions) executed by a platform because of the

programmed routines), and performing motion compensation comprises scaling (element 313) motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

Both Vetro and Ng do not explicitly mention "the motion vector specifying relative distance of reference data from a macroblock". However, the definition of the motion vector in MEPQ is the relative distance from a reference macroblock to a predicted macroblock. Thus, the claim language is inherent in the definition of the motion vector.

Even if it is not. The limitation is well known in the art.

Bose, in an analogous environment, discloses the limitation (col. 17, lines 4-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Bose in the method of Vetro in order to improve the image reconstruction accuracy (Bose, col. 3-col. 4, Vetro, abstract). Doing so would improve accuracy of image reconstruction so that the quality of the method is improved.

An analogous argument with regard to combining Vetro and Ng is addressed with regard to claim 28.

As to claims 33-34, the discussions are addressed with regard to claims 2-3, respectively.

3. Claims 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro, Bose and Ng in view of the article "A fast scheme for altering resolution in the compressed domain" to Dugad et al. ("Dugad" a reference of the record).

As to claims 14 and 26, Vetro further discloses the downsampling comprises implemented a linear filter (Page 5, equation 6 and 7) but does not explicitly mention the bilinear interpolation which is well known in the art.

Dugad, in an analogous environment, discloses using the well known bilinear interpolation scheme for downsampling (Fig. 3, page 216, section 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Dugad in the method of Vetro in order to decrease the computational burden and directly downsample in compression domain (Dugad, page 213, section 1). Doing so would utilize the linear property of DCT transform so as to decrease the computational time so that the efficiency of the method is improved.

4. Claims 8 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro and Ng., further in view of US 6175592 to Kim ("Kim" a reference of the record).

As to claim 8, the combination of Vetro and Ng does not mention displaying downsampled spatial image that appear substantially uniform on a computer monitor.

Kim, in an analogous environment, discloses displaying the downsampled spatial image so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation) that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b, col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical interpolation, especially for even/odd field, creates uniform downsampled image in vertical direction).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Kim in a computer monitor in the method of Vetro in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-27). Doing so would create substantial uniform downsample image in raster format to display on the screen in a computer monitor by the vertical interpolation so that the quality of the method is improved.

As to claim 31, the combination of Vetro and Ng does not mention displaying downsampled spatial image that appear substantially uniform on a computer monitor.

Kim, in an analogous environment, discloses displaying the downsampled spatial image so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation) that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b, col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical interpolation, especially for even/odd field, creates uniform downsampled image in vertical direction).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the scheme of Kim in a computer monitor in the method of Vetro and Ng in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-27). Doing so would create substantial uniform downsample image in raster format to display on the screen in a computer monitor by the vertical interpolation so that the quality of the method is improved.

5. Claims 15 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vetro, Ng, Bose and Dugad, further in view of US 6222550 to Rosman et al. ("Rosman" a reference of the record).

As to claims 25 and 27, the combination Vetro, Ng, Boses and Dugad discloses bilinear interpolation but does not mention 3D pipeline which is well known in the art.

Rosman, in an analogous environment, discloses using 3D pipeline to perform the bilinear interpolation (Fig. 3, col. 1, lines 8-9, col. 12, lines 5-27).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the pipeline scheme of Rosman in the method of Vetro and Dugad in order to increase computing speed and performance (Rosman, col. 1 lines 38-42 and col. 11, lines 7-44). Doing so would increase the computing speed for the bilinear interpolation by using the 3D pipeline so that the efficiency of the method is improved.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Primary Patent Examiner